

Draft Project Management Indicator Species Report
North Shore Restoration Project

Upper Lake Ranger District
Mendocino National Forest

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Introduction

The purpose of this report is to evaluate and disclose the impacts of the North Shore Restoration Project on the habitat of the thirteen (13) Management Indicator Species (MIS) identified in the Mendocino National Forest Land and Resource Management Plan (LRMP) (USDA 1995). This report documents the effects of the proposed action and alternatives on the habitat of selected project-level MIS. Detailed descriptions of the North Shore Restoration Project alternatives are found in the EA.

Direction Regarding the Analysis of Project-Level Effects on MIS Habitat

Project-level effects on MIS habitat are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects will change the habitat in the analysis area.

Adequately analyzing project effects to MIS generally involves the following steps:

- ❑ Identifying which habitat and associated MIS would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- ❑ Summarizing the bioregional-level monitoring identified in the LRMP, as amended, for this subset of MIS.
- ❑ Analyzing project-level effects on MIS habitat for this subset of MIS.
- ❑ Discussing bioregional scale habitat and/or population trends for this subset of MIS.
- ❑ Relating project-level impacts on MIS habitat to habitat and/or population trends at the bioregional scale for this subset of MIS.

This Management Indicator Species (MIS) Report documents application of the above steps to select project-level MIS and analyze project effects on MIS habitat for the North Shore Restoration Project (NSRP).

Current Conditions

The Project area contained a variety of vegetation types. The California Wildlife Habitat Relationship system identified eighteen different vegetation types. These types were present in varying concentration from grassland, pure chaparral stands to a combination of chaparral – hardwood, conifer – hardwood, or mixed conifer associations. Most of the acreage in the project area burned under hot, windy conditions creating a mosaic of live and dead vegetation. The mosaic features higher severity areas where nearly all vegetation is dead and lower severity areas where a mixture of dead and live vegetation is present. Also within the mosaic green islands are present (Silviculture Report pg 7). (Refer to Table 1 for vegetation type code. Refer to Table 2 for information concerning vegetation and fire severity.)

Table 1. CWHR Vegetation types and Corresponding Three Letter Type Code

CWHR* TYPE CODE	Vegetation Type
BOP	Blue Oak-Foothill Pine
BOW	Blue Oak Woodland
COW	Coastal Oak Woodland
CPC	Closed-Cone Pine-Cypress
DFR	Douglas Fir
MHC	Montane Hardwood-Conifer
MHW	Montane Hardwood
PPN	Ponderosa Pine
SMC	Sierran Mixed Conifer
VOW	Valley Oak Woodland
AGS	Annual Grass
CRC	Chamise-Redshank Chaparral
MCH	Mixed Chaparral
MCP	Montane Chaparral
MRI	Montane Riparian
PAS	Pasture
WTM	Wet Meadow
*California Wildlife Habitat Relationship	

Project Area Vegetation Types

The existing conditions of the vegetative resources are organized around the ecological environments depicted by vegetation type present. The following information is presented for each vegetation type that exists or was present pre-fire within the project area, and is addressed in terms of its burn severity which represents the existing conditions.

Post Fire Burn severity

The Ranch fire burned with varying intensity across the landscape. Fire behavior in some locations ranged from creeping and smoldering to group torching, but the vast majority of the fire behavior was a fast moving crown fire. Five mortality classes have been identified and used to describe the post-fire vegetation conditions. These classes are described as follows:

Unburned (Burn severity rate of 0 percent basal area loss) contiguous areas within the fire perimeter that did not experience fire.

Low (Burn severity rates of 0-24 percent) result from low severity fires where typically duff and ground vegetation were lightly burned, many areas of unburned ground vegetation remain throughout the stand, and less than 25 percent of the dominant and co-dominant overstory trees were killed by the wildfire.

Mixed (Burn severity rates of 25-49 percent basal area loss) result from fires ranging from moderate severity in stands of mostly unburned overstory trees and low-to-moderate duff reduction and mortality in the ground vegetation to moderately high severity fires that can significantly reduce much of the duff, burning the tops of a large portion of the ground vegetation, and killing up to 49 percent of the overstory trees. The result is a mosaic that can include islands of green trees intermixed with scattered clumps of dead and live trees.

High (Burn severity rates of 50-74 percent basal area loss) result from high severity fire occurring in which the duff and tops of the ground vegetation was nearly all consumed, leaving

a quarter or less unburned or lightly burned, and from 5 to 75 percent of the trees were killed. These areas experienced fire intensities that resulted in fire effects ranging from complete crown scorch to consumption of fine twigs and needles on standing trees.

Very High (Burn severity rates of 75-100 percent basal area loss) similar fire effects as experienced under high with up to 100 percent of the trees being killed. Extensive duff and ground vegetation burned to exposed soil conditions.

Change in vegetation structure and species composition within the NSRP area is most prevalent in the very high mortality class. Within the project area, this class accounts for approximately 76 percent of the area. Burn severity resulting in vegetation mortality 75 percent or greater essentially resets the successional stage. Burn severity at this rate effectively removes all mid to late successional habitat leading to the development of new structure of an early successional stage. At this stage grass/forb/ tree or shrub seedling becomes the dominate vegetation. Important to recognize is that the other burn severity classes result in only 9 percent in the high severity class, 7 percent experienced mixed severity, while 3 percent with low severity and 4 percent was unburned.

Table 2 represents project area burn severity by burn severity class in term of basal area loss and the number of acres within each class (Silviculture Report pg 10).

Table 2: Burn Severity

Burn Severity Classes	Percent Burn Severity within the Project Area by Burn Severity Classes	
	Acres	Percent Basal Area Loss
No Loss 0%	1791	4%
Low 0-24%	1335	3%
Mixed 25-49%	2750	7%
High 50-74%	3656	9%
Very High 75-100%	30277	76%

Table 3 represents the Conifer project area burn severity classes expressed in percent basal area loss within the dominate conifer vegetation types.

Table 3: Dominate Conifer Vegetation Type

Burn Severity Classes	Percent Burn Severity Area by CWHR* Vegetation Cover Types							Total
	Dominant Conifer Vegetation Type							Percent
	DFR		PPN		SMC			Basal
	Acres	Area %	Acres	Area %	Acres	Area %	Total Acres	Area Loss
No Loss 0%	0	0%	67	5%	73	3%	140	3%
Low 0-24%	56	8%	153	11%	175	8%	384	9%
Mixed 25-49%	110	15%	282	20%	334	15%	726	17%
High 50-74%	116	16%	269	19%	348	16%	733	17%
Very High 75-100%	440	61%	665	46%	1246	57%	2351	54%
Grand Total	722		1436		2176		4334	

*California Wildlife Habitat Relationship

Table 4 - shows the project area by burn severity classes within the Hardwood Forest Vegetation.

Burn Severity Classes	Percent Burn Severity Area by California Wildlife Habitat Relationship Vegetation Cover Types													Total
	Hardwood Forest Vegetation Types													Percent
	BOP		BOW		COW		MHC		MHW		VOW			Basal
	Acres	Area %	Acres	Area %	Acres	Area %	Acres	Area %	Acres	Area %	Acres	Area %	Total Acres	Area Loss
No Loss 0%	59	13%	25	10%	5	10%	113	3%	385	5%	2	1%	589	4%
Low 0-24%	16	3%	2	1%	0	0%	238	7%	437	6%	26	8%	719	5%
Mixed 25-49%	44	9%	33	13%	4	8%	473	14%	782	11%	75	24%	1411	10%
High 50-74%	54	12%	69	27%	8	17%	513	15%	956	13%	83	27%	1683	12%
Very High 75-100%	293	63%	124	49%	31	65%	1983	60%	4734	65%	127	41%	7292	50%
Grand Total	466		253		48		3320		7294		313		11694	

Table 5 - shows the project area by burn severity classes within the Grassland and Shrubland Vegetation Types. (Note: the following table is based on canopy cover loss.)

Burn Severity Classes	Percent Burn Severity Area by Forest Vegetation Cover Types											Total
												Percent
	Grassland and shrubland Vegetation Types											Canopy
	AGS	%CC Loss	CRC	%CC Loss	MCH	%CC Loss	MCP	%CC Loss	URB	%CC Loss	Total Acres	Cover Loss
No Loss 0%	168	11%	328	7%	816	6%	37	2%	11	8.59%	1360	6%
Low 0-25%	139	9%	48	1%	422	3%	33	2%	2	1.56%	645	3%
Mixed 25-49%	133	8%	43	1%	350	2%	39	2%	9	7.03%	574	3%
High 50-74%	163	10%	55	1%	413	3%	45	3%	18	14.06%	695	3%
Very High 75-100%	980	62%	4420	90%	12239	86%	1465	90%	88	68.75%	19192	86%
Grand Total	1583		4895		14240		1619		128		22466	100%

Desired Condition

The desired future condition (DFC) is a resilient landscape with a mix of species composition, structure, and function that ensure long-term sustainability, forest growth and productivity, and resistance and resilience to stressors (e.g., climate change, fire, pathogens) as required by National Forest Management Act (NFMA), Land and Resource Management Plan (LRMP), and Forest Service policy.

The vegetation resource desired condition will follow the appropriate management prescription for the three management areas associated with the NSRP.

These areas are Bartlett, Middle Creek and Ruppert. Management prescription appropriate for these areas are found in Table 6 below.

Table 6: Management Prescription (Rx)

NSRP LRMP Management Areas	LRMP MANAGEMENT PRESCRIPTION	Basic Vegetation Type	Vegetation Management Goals
Bartlett	Rx-1, Rx-3, Rx-4, Rx-6	Hardwood, Chaparral, Conifer	Seral Stage Diversity
Middle Creek	Rx-1, Rx-3, Rx-4, Rx-6	Hardwood, Chaparral, Conifer	Seral Stage Diversity
Ruppert	Rx-1, Rx-3, Rx-4, Rx-6, Rx7, Rx12	Hardwood, Chaparral, Conifer	Seral Stage Diversity

Alternatives

Alternative 1 – No Action

This alternative provides a baseline for comparison of environmental consequences of the other alternatives to the existing condition.

Alternative 2 – Proposed Action

For a detailed description of the Proposed Action, see Chapter 2 of the NSRP EA.

Salvage timber harvest of fire killed and injured (dying) trees will comply with the following prescriptions.

Matrix Salvage Units (RX 7 -Timber Modified)

Follow the Marking Guidelines for Fire-Injured Trees in California (Smith et al. 2011) and remove all merchantable fire killed trees. (14" DBH or greater with a 0.7 or higher probability of mortality. Marking Guidelines for Fire-Injured Trees in California provide a method for determining the probability of fire injured tree to succumb to fire impacts (Silviculture Report pg 19).

Refer to Post Treatment Snag Retention guidelines described below.

Refer to Post Treatment Coarse Woody Debris guidelines described below.

100 Acre LSR

100 Acre LSR Salvage Units (RX 6 -Late-Successional Reserves)

Follow the Marking Guidelines for Fire-Injured Trees in California (Smith et al. 2011) and remove all merchantable fire killed trees (14" DBH or greater with a 0.9 or higher probability of mortality. Retaining standing live trees except for trees with a 0.9 probability of mortality will address the LRMP objective of including those injured that are likely to survive. Surviving trees provide a significant residual of larger trees in the developing stand. Defects caused by fire in

residual trees may accelerate development of structural characteristics suitable for associated late successional species. Those damaged trees may eventually die, and will provide additional snags (Silviculture Report pg 10).

Refer to Post Treatment Snag Retention guidelines described below.

Refer to Post Treatment Coarse Woody Debris guidelines described below.

Protect existing hardwood stump sprouts where possible.

Riparian Reserves (RX 4 -Minimal Management)

Follow the Marking Guidelines for Fire-Injured Trees in California (Smith et al. 2011) and remove all merchantable trees with a 0.9 or higher probability of mortality.

Refer to Post Treatment Snag Retention guidelines described below.

Refer to Post Treatment Coarse Woody Debris guidelines described below.

Post Treatment Snag Densities:

Retain fire killed conifer trees for snag retention at a rate of four of the largest snags per acre averaged over 40 acres of matrix area. Trees retained for snags maybe either Douglas-fir, ponderosa, or sugar pine where possible two of the four trees retained for snags should be Douglas-fir as Douglas-fir generally has a longer retention time frame. Cluster snag trees where such natural clumps of the largest trees in the stands occur, and scatter others where stands are more uniform in size. Retained snags maybe hard (recently killed) and soft (older, rotten, structurally weakened) snags where they are not a current or potential future safety or fuel hazard.

Where snag densities exceed the metrics in the fuels report follow the fuels prescription.

Use variable spacing if possible in distributing snags to mimic natural stands. Snag spacing can be applied with flexibility to ensure that the most highly desired snags are retained. To maintain diversity and to avoid single tree species retention, the species type retained would be in the same proportion as the species that occur naturally in the project area.

Retain any tree with nests or stick platforms.

Retain all pre-fire existing un-merchantable snags unless they pose a threat to human safety or occur in densities that could result in high fuels levels. Refer to the Fire and Fuels Report for more information.

Retain all hardwood snags, particularly black oak snags over 12" DBH if they do not pose a safety or fuels hazard.

Post treatment Coarse Woody Debris (CWD)

Maintain a minimum of 5 to 20 tons per acre of CWD comprised of a minimum of four recently-downed logs per acre, averaged over 40 acres of matrix area. When present focus retention on logs equal to or greater than 20 inches in diameter (large end), or the largest diameter logs available. Retained logs should range from 15 to 20 feet in length, with one log per acre greater than 20 feet in length.

Maintain all existing large logs unless they contribute to hazardous fuels levels

Where feasible Retain coarse woody debris already on the ground and protect from disturbance during treatment (e.g. slash burning and yarding) and site preparation/planting.

All coarse woody debris (CWD), greater than 20 inches in diameter at the large end and 10 or more feet in length (preferably over 20 feet), would be protected during harvest operation, fuels treatments and site preparation. If the amount of larger coarse woody debris (greater than 20 inches in diameter at the large end) is abundant enough to cause a hazardous fuels condition, a portion of these logs may be treated/removed. Remove the smallest logs first until fuels objectives are met. Retain the maximum number possible while still meeting fuels objectives.

Refer to Table 7 – Future fuel reduction treatment activities may be applied to these non-commercially treated acres. Refer to the Fire and Fuel prescription and the North Shore Restoration Project Fuels Report for more details.

Table 7: RAVG Burn Severity Salvage Area

Salvage Area Burn Severity Classes	Acres	Total Percent Basal Area Loss
No Loss 0%	0	0%
Low 0-24%	38	6%
Mixed 25-49%	105	18%
High 50-74%	79	13%
Very High 75-100%	369	62%
Grand Total	592	

Snag Retention in Salvage units

Marking guidelines for fire-injured trees have been developed following guidance from Table 8 Snag retention guidelines from the Mendocino Land and Resource Management Plan 1995 for Montane Conifer. The marking guidelines require that the largest snags per acre (4 snags Rx7, 4 snags Rx6 and 4 snags Rx4) averaged over forty acres be retained. This could result in some units having a cluster of the largest snags in pockets.

Table 8: Snag retention guidelines from the Mendocino Land and Resource Management Plan, 1995 for Montane Conifer

Habitat Variable	Optimum	Sub-optimum	Low
Average density			
...15-24" DBH	>3.0/acre	1.2-3.0/acre	<1.2/acre
...>24" DBH	>0.5/acre	0.2-0.5/acre	<0.2/acre
...Total	>3.5/acre (max 10/acre)	1.4--3.5/acre (max 5/acre)	<1.4/acre (max 3/acre)
Height	>40 feet	20-40 feet	<20 feet
Dispersion	One group per 5 acres or less, with 15+ snags	One group per 5-15 acres, with 5-15 snags	Even dispersion

Habitat Variable	Optimum	Sub-optimum	Low
Hard:Soft Ratio	>3:1	2:1-3:1	<2:1
Location	Edges of meadows, brushfields, streams, and other water	Throughout wooded stands	Rocky, open slope, Barren areas
Species	Douglas fir, Gray pine, Ponderosa pine, black oak, blue oak, madrone	White oak, live oak	

Forested Burned Areas not treated by Salvage Operations

Salvage operations are being applied to an estimated 592 acre area. Outside salvage treatment units there is substantial area of forest cover located within the burned area which burned at various levels of severity. Total conifer vegetation type consist of 4334 acre. Salvage treatment is being applied to 14 percent of the conifer acreage within the project area. The 3742 acre area where commercial salvage operations will not take place will be subject to fuels treatment as part of the Fire and Fuels prescription (Appendix B of the Fuels Report).

Reduction in fuel loading in these areas will be performed through a combination of thinning of trees and or snags 21 inches DBH and less (both mechanical and hand) and prescribed fire aimed to reduce fuels over time. Refer to the Fire and Fuels treatment prescription. Trees 21" and above exhibiting any sign of green shall be retained on a 15-30 foot spacing from trees less than 21" DBH; therefore, not following the marking guidelines for fire killed trees.

Reforestation

Reforestation is an essential part of post-fire restoration. Reforestation efforts shall first begin in Areas where reforestation activates have previously occurred. Within the North Shore Restoration project area, both planting and natural regeneration will contribute to establishing forest cover ideal for watershed stabilization, wildlife habitat cover and forage, seed source establishment, regaining timber production, and aid in reaching desired future condition in recognition of potential climate change.

Reforestation shall take place on approximately 1617 acres of conifer forestland where plantations were established in the past. These plantations burned at various levels of burn severity with 74 percent of the acreage burning at very high severity.

After successful reforestation seedlings and natural regeneration may need to be released from competition where necessary to promote survival and growth of seedlings. This will be determined through on site monitoring efforts. Within the first 1-3 years planted areas will be monitored to determine the need for competing vegetation control. Potential treatment will

involve, hand or mechanical grubbing, and or herbicide of grasses and other competing vegetation away from the trees in a 5 foot radius circle (Silviculture Report pg 29)

Alternative 3 – Proposed action with limited use of herbicides

This alternative follows the actions of Alternative 2 with limited herbicide use. Under this alternative, herbicide use for release treatments will be limited to research plots. Use of herbicides to control invasive plants will remain the same as Alternative 2.

Alternative 4 – Proposed action with no herbicide use

This alternative follows the actions of Alternative 2 without the use of herbicides.

Alternative 5 – Alternative 5 modifies the proposed action such that snags and CWD greater than 21" DBH would be retained.

Selection of Project level MIS

Management Indicator Species (MIS) for the Mendocino NF are identified in the LRMP (1995). The habitats and ecosystem components and associated MIS analyzed for the project were selected from this list of MIS, as indicated in Table 1. In addition to identifying the habitat or ecosystem components (1st column), the associated MIS (2nd column), the Table discloses whether or not the habitat of the MIS is potentially affected by the North Shore Restoration Project (3rd column).

Table 1. Selection of MIS for Project-Level Habitat Analysis for the North Shore Restoration Project

Habitat or Ecosystem Component	Mendocino NF Management Indicator Species <i>Scientific Name</i>	Category for Project Analysis ¹
Snags	Acorn Woodpecker, Douglas tree squirrel, fisher, northern goshawk, marten, pileated woodpecker, northern spotted owl, western gray squirrel	3
Hardwoods	Acorn Woodpecker, black tailed deer, Douglas tree squirrel, Tule elk	2
Riparian	Bald Eagle, Black tailed deer, fisher, northern goshawk, marten, peregrine falcon, Tule elk	2
Meadow	Black-tailed deer, Tule elk	2
Shrub habitat	Black-tailed deer, California thrasher	3
Old growth	Fisher, northern goshawk, marten, pileated woodpecker, northern spotted owl	2
Dead & Down	Fisher, northern goshawk, marten, pileated woodpecker, northern spotted owl	3

¹ **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.

Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.

Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

Habitat or Ecosystem Component	Mendocino NF Management Indicator Species <i>Scientific Name</i>	Category for Project Analysis ¹
Lithic areas	Peregrine Falcon	2
Lotic habitat	Rainbow Trout	2

The MIS whose habitat would be either directly or indirectly affected by the North Shore Restoration Project, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for project-level MIS analysis for the project are: acorn woodpecker, Douglas tree squirrel, fisher, northern goshawk, marten, pileated woodpecker, northern spotted owl, Black Tailed deer, and California Thrasher. Effects to fisher, northern goshawk, marten, and northern spotted owl are discussed in more detail in the Biological Evaluation.

Category 2 species are not analyzed because the project does not remove or modify the habitats in which indicator species signify.

Effects of Proposed Project on the Habitat for the Selected Project-Level MIS.

The following section documents the analysis for the following 'Category 3' species: acorn woodpecker, Douglas tree squirrel, fisher, northern goshawk, marten, pileated woodpecker, and northern spotted owl. The analysis of the effects of the Bartlett Roadside Hazard Tree Removal Project on the MIS habitat for the selected project-level MIS is conducted at the project scale.

Snags

Habitat/Species Relationship.

There are several species identified in the Mendocino NF LRMP that are indicators for snag habitat: Acorn Woodpecker, Douglas tree squirrel, fisher, northern goshawk, marten, pileated woodpecker, and northern spotted owl. Fisher, northern goshawk, marten, and northern spotted owl are discussed in the biological evaluation for the Bartlett project.

Project-level Effects Analysis –

Habitat Factor(s) for the Analysis: Snags

Current Condition of the Habitat Factor(s) in the Project Area: Following the Ranch Fire in 2018 there is a plethora of snags on the landscape, fire killed or otherwise. Post-fire there have been acorn and pileated woodpeckers observed in the project area (as noted by personal observations by former district biologist C. Hagemann).

Alternative 2 (Proposed Action)

Direct and Indirect Effects to Habitat.

The North Shore Restoration Project proposed to salvage trees within 592 acres of the project area. As mentioned previously, total conifer vegetation type consists of 4334 acres, salvage treatment is being applied to 14 percent of this conifer acreage. The 3742 acre area where commercial salvage will not occur, will be subject to fuels reduction treatments (this treatment would not remove trees exhibiting any sign of green 21 inches DBH or greater. This alternative also includes reforestation, release treatments, and invasive plant treatments. By following the snag requirements listed above, and retaining trees 21" and above exhibiting any sign of green will allow the forest to maintain legacy structure needed for forests to develop into stands that are variable and complex.

Acorn Woodpecker (*Melanerpes formicivorus*)

Acorn woodpeckers are a common yearlong resident below 6,900 feet elevation. Their diet consists of acorns (winter food), flying insects, and sap. They require low-density stands of large oaks with sparse canopy closure, as well as larger snags for granaries and nesting. Most good habitats below 3,000 feet elevation and are within ¼ mile of water. Average nesting territories, approximately six to ten acres in size, are defended by family units. These family units consist of up to 16 birds and are composed of two breeding adults, their offspring, and a variable number of close relatives. The entire family unit assists in raising young and caching food. Suitable habitat includes at least 1 to 2 acres of large oak and/or pine.

As mentioned previously, there has been incidental sightings of acorn woodpecker within the project area. Currently snags occur within the salvage units, but moderate-to-high quality foraging habitat (acorn bearing oaks) has been reduced in severely burned stands due to the loss of mast producing trees and live conifers (see tables 3 and 4). Snags will be reduced within the Salvage units, however, due to snag requirements, there will be optimal number left per LRMP. Abundant snags will continue to occur within the fuel treatment units due to the Ranch Fire and snag retention guidelines and retaining trees exhibiting any green 21 inches DBH or greater.

Pileated woodpecker (*Dryocopus pileatus*)

Pileated woodpeckers occur in dense mature forests with adequate stumps, logs and snag densities and size classes. Nests are mainly in trees 20" DBH or greater, and are active between May and July. A permanent water source is required near nesting sites. Studies in California and Birginia found that most nest sites are found within 165 feet of water and never farther than 500 feet (Timossi et. Al. 1994, Conner et al. 1975). Pileated woodpeckers will excavate nest sites in both large diameter conifer and hardwood snags. Home range size is an average of 300 acres.

Incidental sightings of pileated woodpecker have been reported throughout the analysis areas. Although the pileated woodpecker will use burned forest, the nesting habitat quality is reduced in severely burned sites, due to the reduction of live trees and canopy closure. Foraging habitat still exists in 568 acres within the project area (44 of these acres are within the salvage treatment units). While this habitat will remain as such, removal of dead and dying trees

greater than 14 inches DBH (within salvage units) will reduce future snags. However, abundant snag habitat will remain both within and outside the treatment units.

Western Gray Squirrel (*Sciurus griseus*)

Suitable habitat consists of mature stands of hardwood and conifer hardwood with a close association to oaks. The average home range is between 0.5 and 1.8 acres for females, and between 1.2 and 2.5 acres for males. Western gray squirrels appear to be well distributed throughout the forest (as noted by personal observations by former district biologist L. Angerer).

Much of the moderate to high quality habitat for gray squirrel was lost in the Ranch fire (see tables 3 and 4). Although, remaining habitat will be maintained, removal of dead and dying trees will reduce future snags (dead and dying trees greater than 14 inches DBH within salvage units, and no trees with any green 21 inches DBH and greater will be removed in Fuels units, and no living hardwoods will be removed in any treatment units). However, abundant snag habitat will remain both within and outside the salvage units.

Douglas Squirrel (*Tamiasciurus douglasii*)

Based on literature, these squirrels are not restricted to true fir stands (Zeiner et al. 1990, Steele 1999). High quality habitat consists of open and closed medium to large sawtimber, intermediate to mature conifer and conifer hardwood, in stands 42 to 315 years old, from 0 – 11,000 feet in elevation. These squirrels also occur in younger, more open stands of conifer and conifer hardwood, however, their densities are lower. They are omnivorous but primarily eat conifer seeds and fungi. Nests can be located in live tree and snag cavities, hollow logs, on tree branches (made of twigs, grass, bark, lichens, etc) and ground burrows. In absence of conifer cone crops, concentrations of Douglas squirrels have moved to burned or logged areas where deciduous trees and bushes were producing seed crops. Territory sizes range from 0.5 to 3 acres depending on habitat quality. Douglas squirrels occur throughout the Forest (as noted by personal observations by former district biologist L. Angerer).

Although this species use burned forest, the habitat quality is low in the severely burned sites due to the reduction of live trees for seed production and canopy closure. As a consequence of the Ranch Fire, Douglas squirrel habitat is much reduced in the project area as moderate to high quality foraging habitat (conifer stands) has been greatly reduced in the severely burned stands (due to the reduction of live conifer canopy). Live trees, as well as dead conifer and hardwood trees will be retained throughout the project area.

Effects of Alternative 3

This alternative follows the actions of Alternative 2 with limited herbicide use. Under this alternative, herbicide use for release treatments will be limited to research plots. Use of herbicides to control invasive plants will remain the same as Alternative 2. The effects and determinations for this alternative would remain the same as for alternative 2, however the expansion of Shrubland is more likely to increase under this alternative. Conversely, the possible decrease of forested land is more likely as well.

Effects of Alternative 4

This alternative follows the actions of Alternative 2 without the use of herbicides. The effects for this alternative would remain the same as for alternative 2, however the expansion of Shrubland is more likely to increase under this alternative. Conversely, the possible increase in loss of forest land is more likely as well. Cumulative effects, when looking at the long term, would include loss of habitat for the Shrubland component as invasive species component will be allowed to expand greatly. This would reduce connectivity of these habitats as well as reduce the acreage of these habitats – thus negatively impacting all species, including the ones analyzed above.

Effects of Alternative 5

Alternative 5 modifies the proposed action such that snags and Coarse Woody Debris (CWD) greater than 21" DBH would be retained. Compared to the proposed action, this may increase long-term fuel loading while also increasing coarse woody debris and large woody debris on hillslopes. Although this alternative would have the least impact on snag dependent species in the short term, the treatments designed for Alt. 2 should have only minimal impact on these species. However, without removal of snags greater than 21 " DBH, in the long term, fuels levels would increase due to fire killed trees falling, resulting in larger re-burn potential (Fire and Fuels Report pg 2) with greater negative impacts to this species habitat in the long term.

Effects of a No Action Alternative

If there were no action taken within the North Shore project area then snag and dead and down wood would increase greatly over time. As post-fire snags begin to fall, surface fuel loads will increase dramatically particularly in previously forested stands. Surface fuel loads are the receptive fuel bed and primary carrier of surface fire. The fuel loading is also directly related to the surface fire spread and flame lengths. In addition to the trees falling over time, shrub regeneration in the newly opened canopies will create a fuel bed conducive to reburn in future wildfires. Such a reburn is likely to produce very high intensity fires. This fire behavior will in most areas prevent trees (whether naturally regenerating or planted) from surviving future wildfires. This is a WUI area with a high occurrence of human caused ignitions. The probability of another wildfire occurring, before this area can reach a succession stage that is more resilient to wildfires, is likely (Fuels Report pg 6).

By not treating for invasive plant species, we will continue to lose connectivity of habitats as the wave of invasives continue to expand and replace our native flora and subsequently our native fauna.

Cumulative Effects to Habitat in the Analysis Area.

Portions of the North Shore Restoration Project were commercially treated in 2012 under the Lakeview timber harvest. The Ranch Fire also burned through this area in 2018. The North Shore Project also overlaps areas of Bartlett Hazard Tree Removal project. There are a couple private land salvage operations occurring within the project area as well.

Cumulative Effects Conclusion:

The majority of the NSRP area burned at a moderate to high severity. All trees expected to survive would be retained and continue to provide elements of habitat. Areas untreated, unburned, low severity burn, as well as areas outside the fire boundary continue to provide snag habitat for this species.

Although most dead trees, within the salvage units would be removed, snags will continue to be provided into the future in the untreated forest and by snag recruitment by retaining trees greater than 21 inches DBH that exhibit any green. These snags and the stumps of the salvaged trees will provide future CWD utilized by snag depended species for foraging. Due to the retention requirements of conifer and hardwood snags, cavity dependent species can continue to utilize retained conifer and hardwood snags for nesting/denning and foraging after salvage treatment.

Therefore, when looking at the direct and indirect effects of past and current actions within the NSRP, the effects of this project would not add to the effects of the other projects that have or will occur in the North Shore Restoration Project area.

Dead & Down (or Course Woody Debris)

Habitat/Species Relationship.

There are several species identified in the Mendocino NF LRMP that are indicators for dead and down: fisher, northern goshawk, marten, pileated woodpecker, and northern spotted owl. Fisher, northern goshawk, marten, and northern spotted owl are discussed in the biological evaluation for the North Shore Restoration Project.

Project-level Effects Analysis –

Habitat Factor(s) for the Analysis: coarse woody debris (CWD), dead and down

Current Condition of the Habitat Factor(s) in the Project Area: The Ranch Fire consumed much of the dead and down within the project area. Trees and debris have collected since the fire but it is not likely to resemble the conditions pre-fire.

Alternative 2

Direct and Indirect Effects to Habitat.

Although the NSRP will remove some of the dead and down CWD from the project area there is a requirement to maintain 5 to 20 tons/acre of CWD comprised of a minimum of four recently-downed logs per acre. When present, focus retention on logs equal to or greater than 20 inches in diameter (large end), or the largest diameter logs available. Retained logs should range from 15 to 20 feet in length, with one log per acre greater than 20 feet in length.

Fuels treatments propose leaving between 5 – 20 tons/acre of down course woody material. This amount was indicated to be the optimum quantity of CWD for wildlife in warm dry ponderosa pine and Douglas-fir types (Brown et.al 2003). Retaining this amount of CWD will

allow the forest to maintain legacy components needed for forests to develop into stands that are variable and complex.

Pileated woodpecker (*Dryocopus pileatus*)

(See snag section above.) Hazardous fuels conditions would be greatly reduced after fuels treatments begin within salvage units. However, by following the design criteria (maintaining 5 – 20 tons/acre of CWD on the forest floor), habitat component will be maintained and continue to provide critical structure needed for this species' prey.

Effects of Alternative 3

This alternative follows the actions of Alternative 2 with limited herbicide use. Under this alternative, herbicide use for release treatments will be limited to research plots. Use of herbicides to control invasive plants will remain the same as Alternative 2. The effects and determinations for this alternative would remain the same as for alternative 2, however the expansion of Shrubland is more likely to increase under this alternative. Conversely, the possible decrease of forested land is more likely as well.

Effects of Alternative 4

This alternative follows the actions of Alternative 2 without the use of herbicides. The effects for this alternative would remain the same as for alternative 2, however the expansion of Shrubland is more likely to increase under this alternative. Conversely, the possible increase in loss of forest land is more likely as well. Cumulative effects, when looking at the long term, would include loss of habitat for the Shrubland component as invasive species component will be allowed to expand greatly. This would reduce connectivity of these habitats as well as reduce the acreage of these habitats – thus negatively impacting all species, including the ones analyzed above.

Effects of Alternative 5

Alternative 5 modifies the proposed action such that snags and CWD greater than 21" DBH would be retained. Compared to the proposed action, this may increase long-term fuel loading while also increasing coarse woody debris and large woody debris on hillslopes. Although this alternative would have the least impact on dead and down wood (CWD) dependent species in the short term, the treatments designed for Alt. 2 should have only minimal impact on these species. However, without removal of some snags and CWD greater than 21 " DBH, in the long term, fuels levels would increase due to fire killed trees falling, resulting in larger re-burn potential (Fire and Fuels Report pg 2).

Effects of a No Action Alternative

If there were no action taken within the North Shore project area then snag and dead and down wood would increase greatly over time. As post-fire snags begin to fall, surface fuel loads will increase dramatically particularly in previously forested stands. Surface fuel loads are the receptive fuel bed and primary carrier of surface fire. The fuel loading is also directly related to the surface fire spread and flame lengths. In addition to the trees falling over time, shrub regeneration in the newly opened canopies will create a fuel bed conducive to reburn in future

wildfires. Such a reburn is likely to produce very high intensity fires. This fire behavior will in most areas prevent trees (whether naturally regenerating or planted) from surviving future wildfires. This is a WUI area with a high occurrence of human caused ignitions. The probability of another wildfire occurring, before this area can reach a succession stage that is more resilient to wildfires, is likely (Fuels Report pg 6). A large reburn of the area would not be beneficial to the habitat of the species that require dead and down wood nor would it be retained as legacy features in an older forest.

Cumulative Effects to Habitat in the Analysis Area.

Portions of the North Shore Restoration Project were commercially treated in 2012 under the Lakeview timber harvest. The Ranch Fire also burned through this area in 2018. The North Shore Project also overlaps areas of Bartlett Hazard Tree Removal project. There are a couple private land salvage operations occurring within the project area as well.

Cumulative Effects Conclusion:

The majority of the NSRP area burned at a moderate to high severity. All trees expected to survive would be retained and continue to provide elements of habitat. Areas untreated, unburned, low severity burn, as well as areas outside the fire boundary continue to provide snag habitat for this species.

Although dead trees, within the salvage units would be removed, snags will continue to be provided into the future in the untreated forest. These snags and the stumps of the salvaged trees will provide future CWD utilized by snag depended species for foraging. Due to the retention requirements of conifer and hardwood snags, cavity dependent species can continue to utilize retained conifer and hardwood snags for nesting/denning and foraging after treatment. Retention of trees exhibiting any green 21inches or greater will provide for an abundance of snags into the future.

Therefore, when looking at the direct and indirect effects of past and current actions within the NSRP, the effects of this project would not add to the effects of the other projects that have or will occur in the North Shore Restoration Project area.

Project-level Effects Analysis –

Habitat Factor(s) for the Analysis: shrubland habitat

Current Condition of the Habitat Factor(s) in the Project Area: Following the Ranch Fire in 2018 approximately 90 percent (see table 7) burned at a very high or high severity and approximately 10 percent unburned. Thus, most of the shrub community has been set back to an early seral stage. The shrub community type will stay as such, it comprises approximately 22,466 acres of the project area. This acreage is not expected to change, only the age class will fluctuate with fuel treatments.

Alternative 2

Direct and Indirect Effects to Habitat.

The only places where shrubs will be removed are in areas planned for reforestation (vegetation competing with tree seedlings will be removed – these areas were previously plantations and not shrublands). In the Wildland Urban Interface, the shrub community type will not be replaced in the fuels units, just set back to an earlier seral stage in rotations. In the areas that are planned for reforestation, it was a forest before the ranch fire, so shrubs were not a common component of this vegetation type.

Black-tailed deer (*Odocoileus hemionus*)

Deer most often occur in early to intermediate successional stages of forest, woodland, and shrub habitats. They prefer a mosaic of various aged vegetation that provides woody cover, meadow and shrubby openings, and free water. Suitable habitat consists of a mosaic of vegetation, providing an interspersed of herbaceous openings, dense brush or tree thickets, riparian areas, and abundant edge.

Deer are attracted to burned areas for both new forage opportunities and in utilizing ash for parasite relief. Deer have been seen regularly within the fire area and in the surrounding forests. The most recent California Department of Fish and Wildlife Assessment of Mule and Black-tailed Deer Habitats and Populations in California Report to the Fish and Wildlife Commission, reported that the deer herd population estimates within the state and within this zone have been decreasing for several years now.

(<https://wildlife.ca.gov/Conservation/Mammals/Deer/Population#32712445-population-by-hunt-zone>)

As mentioned previously, due to the Ranch Fire, the area currently is approximately 10 percent cover (unburned or late seral) and 90 percent (burned or early seral) forage of the area classified as Shrubland and grass. The treatments do not propose to change the acreage of Shrubland habitat, but make the cover/forage ratio more of a mosaic (50/50% or 40/60%, LRMP 1995 Appendix E). Where more of the early seral classes would be in areas that are within the WUI and also in areas where we are trying to protect the legacy/forested components that were not burned during the Ranch Fire. But again, this would be dynamic, changing over time.

California thrasher (*Toxostoma redivivum*)

Suitable habitat for this species include areas of late successional chaparral, and shrubby hardwood, an average of four acres in size, provide suitable nesting and foraging habitat up to 6600 feet elevation. Thrashers avoid dense tree canopy. They feed in loose soil and litter on insects, fruits, fungi, acorns, seeds, etc. and seldom forage more than a few feet from shrub cover. Breeding season typically lasts from mid-April to mid-June. Thrashers frequently raise two broods each year and fledging occurs in approximately 14 days.

Prior to the fire, most of the area was late successional habitat for this species. As seen in table 5, approximately 90 percent of the Shrubland habitat was burned, thus leaving a majority of the area in early successional habitat. As mentioned previously, shrubland habitat acreage will remain, however seral stage will change over time. Within salvage treatment units, where reforestation is planned, release treatments may reduce the amount of shrubs, however, these areas were previously forested, thus not considered thrasher habitat.

Cumulative Effects to Habitat in the Analysis Area.

Portions of the North Shore Restoration Project were commercially treated in 2012 under the Lakeview timber harvest. The Ranch Fire also burned through this area in 2018. The North Shore Project also overlaps areas of Bartlett Hazard Tree Removal project. There are a couple private land salvage operations occurring within the project area as well.

Cumulative Effects Conclusion:

Although there are shrubs that will be set back to earlier seral class or removed within the areas designated for release treatments, the acreage of current shrubland habitat will remain the same post treatment.

Currently the majority of the Shrubland habitat has been set back to early seral conditions, but as time progresses, the cover component required by these MIS species, will increase and eventually will reach a desired forage to cover percentage. This mosaic of cover to forage ratios is desirable, not only for wildlife, but for the needs of fire prevention in the WUI areas and protection of our legacy forests. Because the acreage of Shrubland will not change and the cover/forage ration will continue to be more balance over time. When looking at the direct and indirect effects of past and current actions within the NSRP, the effects of this project would not add to negative cumulative effects of the other projects that have or will occur in the North Shore Restoration Project area.

Effects of Alternative 3

This alternative follows the actions of Alternative 2 with limited herbicide use. Under this alternative, herbicide use for release treatments will be limited to research plots. Use of herbicides to control invasive plants will remain the same as Alternative 2. The effects and determinations for this alternative would remain the same as for alternative 2, however the expansion of Shrubland is more likely to increase under this alternative. Conversely, the possible decrease of forested land is more likely as well.

Effects of Alternative 4

This alternative follows the actions of Alternative 2 without the use of herbicides. The effects for this alternative would remain the same as for alternative 2, however the expansion of Shrubland is more likely to increase under this alternative. Conversely, the possible increase in loss of forest land is more likely as well. Cumulative effects, when looking at the long term, would include loss of habitat for the Shrubland component as invasive species component will be allowed to expand greatly. This would reduce connectivity of these habitats as well as reduce the acreage of these habitats – thus negatively impacting all species, including the ones analyzed above.

Effects of Alternative 5

Alternative 5 modifies the proposed action such that snags greater than 21" DBH would be retained. Compared to the proposed action, this may increase long-term fuel loading while also increasing coarse woody debris and large woody debris on hillslopes. Although this alternative would have the least impact on snag dependent species in the short term, the treatments designed for Alt. 2 should have only minimal impact on these species. However, without removal of snags greater than 21", in the long term,

fuels levels would increase due to fire killed trees falling, resulting in larger re-burn potential (Fire and Fuels Report pg 2).

Effects of a No Action Alternative

If there were no action taken within the North Shore project area then snag and dead and down wood would increase greatly over time. As post-fire snags begin to fall, surface fuel loads will increase dramatically particularly in previously forested stands. Surface fuel loads are the receptive fuel bed and primary carrier of surface fire. The fuel loading is also directly related to the surface fire spread and flame lengths. In addition to the trees falling over time, shrub regeneration in the newly opened canopies will create a fuel bed conducive to reburn in future wildfires. Such a reburn is likely to produce very high intensity fires. This fire behavior will in most areas prevent trees (whether naturally regenerating or planted) from surviving future wildfires. This is a WUI area with a high occurrence of human caused ignitions. The probability of another wildfire occurring, before this area can reach a succession stage that is more resilient to wildfires, is likely (Fuels Report pg 6).

By not treating for invasive plant species, we will continue to lose connectivity of habitats as the wave of invasives continue to expand and replace our native flora and subsequently our native fauna.

Summary

The project would not have significant adverse effects on pileated and acorn woodpeckers, western gray and Douglas squirrels, black-tailed deer and California thrasher (and thus this type of habitat they represent), based on the following determinations:

- While snag numbers would be reduced within the project area, an abundance of snags would remain both within and outside of the treatment units due to design criteria in place.
- Salvage units are mostly within moderate to high severity burned stands. The resulting stand conditions (canopy closures and 50 to 100% tree mortality) now provide low capability of suitable habitat for these species. Treatments would not further reduce the capability level of the area.
- Outside of the salvage units, all trees exhibiting green greater than 21 inches DBH will be retained, unless are deemed a hazard. Snag requirements within the salvage units and fuel treatment units will provide the optimum level of snags needed per acre per LRMP 1995.
- CWD will be retained at the level of 5 – 20 tons/acre. This retention will also contribute to stand structure and diversity as the forests begin to mature.

Therefore, based on the above determinations, my conclusion is that the proposed action would not have adverse effects on habitat for these species: and that the proposed action complies with the standards in the LRMP regarding site specific evaluations for Management Indicator Species.

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